



## Technical Information: 4150S

**4150S IS A FREE MACHINING CARBON STEEL HEAT TREATED TO A NOMINAL HARDNESS OF 28-32 HRC.**

**4150S CAN ALSO BE SURFACE HARDENED TO INCREASE WEAR RESISTANCE**

### TYPICAL CHEMICAL COMPOSITION

CARBON	0.50%	CHROMIUM	0.65%
MOLYBDENUM	0.20%	SILICON	0.25%
MANGANESE	1.25%	SULFUR	0.08%

### 4150S SURFACE HARDENING

#### HARDENING

SURFACE SHOULD BE HEATED BY FLAME OR INDUCTION TO 1500°F PLUS OR MINUS 50°F

#### QUENCHING

QUENCH WITH WATER OR COMPRESSED AIR TO BELOW 500°F

COMPRESSED AIR QUENCH WILL RESULT IN LOWER HARDNESS LEVELS THAN WATER QUENCH

### TYPICAL FLAME HARDENED AND WATER QUENCHED SURFACE HARDNESS

MATERIAL TEMPERED FOR 2 HOURS AT TEMPERING TEMPERATURE

Tempering Temperature	Hardness (HRC)
As Quenched	58-63
400°F	56
600°F	52
800°F	48

**Note:** 4150S can be surface hardened using any of the diffusion nitriding processes such as ion, gas, or salt bath

### PHYSICAL PROPERTIES

MODULUS OF ELASTICITY.....	30 PSI X 10 <sup>6</sup> .....(207 GPa)
DENSITY.....	0.282 LB/IN <sup>3</sup>
SUPPLIED HARDNESS.....	28-32 HRC
THERMAL EXPANSION (RT TO 200F).....	6.5 X 10 <sup>-6</sup> IN/F
THERMAL EXPANSION (RT TO 400F).....	7.0 X 10 <sup>-6</sup> IN/F